

Intech Micro 2400-A₁₆-SD



**Supplementary Manual to the
2400-A₁₆ Installation Guide.**

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Warning: These products are not designed for use in, and should not be used for patient connected applications. In any critical installation an independent fail-safe back-up system must always be implemented.

Intech Micro 2400-A16-SD

SD Memory Logging.
Up to 16 Universal Analogue Inputs.
4 Dedicated Digital Inputs.
2 Analogue 4~20mA Outputs.

Description.

The SD version of the 2400-A16 is a great way to achieve a stand-alone method for data logging. The station can be used as a 16 input stand-alone logger, or as part of a SCADA data highway with backup logging facility. The user friendly, free to download **Intech Micro Station Programmer** software (version 5.2.3613.5 or later), supports the reading of SD cards on the 2400-A16-SD.



Features.

- Logging of Analogue Inputs 1~16, Digital Inputs 1~4 and Ambient Sensor onto an SD Card.
 - ◊ Up to 7858811 Data Samples.
 - ◊ Data Store Rates Selectable From 1sec ~ 60min.
 - ◊ Cyclic or Stop Modes when SD Card is Full.
 - ◊ Internal Real Time Clock with Battery Backup.
 - ◊ Read SD Memory Card by removing SD Card and Reading from a Computer SD Port, or using Comms.
- Up to 16 Isolated Universal Analogue Inputs, with Plug In Terminals.
 - ◊ Each Input Individually Selected & Scaled.
- Four Dedicated Digital, Isolated, Optocoupler Inputs.
- Two Analogue, Isolated, 4~20mA Outputs.
- Two Digital, Isolated, Relay Outputs.
- Comms Ports:
 - ◊ Port 1: Isolated RS422/RS485 or Ethernet TCP/IP (option).
 - ◊ Port 2: Isolated RS232/RS485.
 - ◊ Port 3: USB programming port via **XU-USB** programming key.
- Embedded protocols, Auto Detecting:
 - ◊ MicroScan ASCII.
 - ◊ Modbus RTU.
 - ◊ Modbus TCP.
- Easy Programming using **Intech Micro Station Programmer** software.
- Universal AC/DC Power Supply (three options to select from):
 - ◊ H= 85~265Vac, 95~370Vdc.
 - ◊ M= 24~48Vac, 17~72Vdc.
 - ◊ L= 10~30Vdc.
- Compact 35mm DIN Rail Mounting.
- Easy to Install.
- Low Cost.

Quick Overview of using the 2400-A16-SD Logger.

1. **Station Setup:**
Configure the 2400-A16 station with Input types as required.
Configure the 2400-A16 station's SD recording parameters.
2. **SD Card Setup:**
Configure the Pages & Lines for all Inputs being used.
Initialise SD card if more than one computer is used for download.
3. **Record:**
Insert the SD card into the 2400-A16's SD slot, you will hear the latch on the SD socket 'click'. The RECORD LED will flash while the log file is created. Once logging has started, the RECORD LED will stay on. If the log file is already there, the 2400-A16 will use that and the RECORD LED will come on straight away.
4. **Download:**
Using either an SD port on the computer or the 2400-A16's Comms, all new data is downloaded into the Station Programmer software and stored in a log file.

Ordering Information.

All 2400-A16 stations come standard (Default ex factory calibration) with:

All Input Channels Configured to RTD Pt100 0~100°C.
 4 Dedicated Digital Inputs.
 2 Analogue 4~20mA Outputs.
 2 Relay Outputs.
 RS485 or RS232 on Comms Port 2.

ITEM	CODE		DESCRIPTION
SERIES	2400-A16-		
Input Channel Options	I16-		16 Isolated Universal Input Channels.
	I8-		8 Isolated Universal Input Channels.
	Custom-		Custom mix of Isolated and/or Non-Isolated Channels. Please contact Intech.
SD Memory Option	SD-		With SD Data Logging.
	N-		None.
Comms Options (Port 1)	485-		Port 1 Fitted with RS422/RS485 Comms.
	NET-		Port 1 Fitted with Ethernet TCP/IP Comms.
Power Supply Options	H		85~265Vac, 95~370Vdc.
	M		24~48Vac, 17~72Vdc.
	L		10~30Vdc.

Ordering Examples.

2400-A16-I16-SD-485-L: 2400-A16 with 16 Isolated Universal Input Channels, SD Card Logging, RS422/RS485 Comms, 10~30Vdc Power Supply.

2400-A16-I8-SD-NET-H: 2400-A16 with 8 Isolated Universal Input Channels, SD Card Logging, Ethernet TCP/IP Comms, 85~265Vac Power Supply.

RS232 Cable:	
2400-RS232:	Optional 5m RS232 cable for the 2400-A16 (Comms Port 2).
XU-USB:	USB Programming Key for programming 2400-A16-SD using Station Programmer software. (Same Key as used for programming XU Series transmitters, Z-2400 Wireless Series and IN-uP4). Note: The 2400-A16-SD can also be programmed via the on-board Comms Ports.

Other 2400 Models Include:

2400-IS: Isolated Auto-Detecting USB/RS232 to RS485/422/232 Converter.

2400-M-R: Field Station with up to 16 Non-Isolated RTD Pt100/Pt1000 Inputs, 4 Digital Inputs, 2 Relay Outputs and 2 Analogue 4~20mA Outputs.

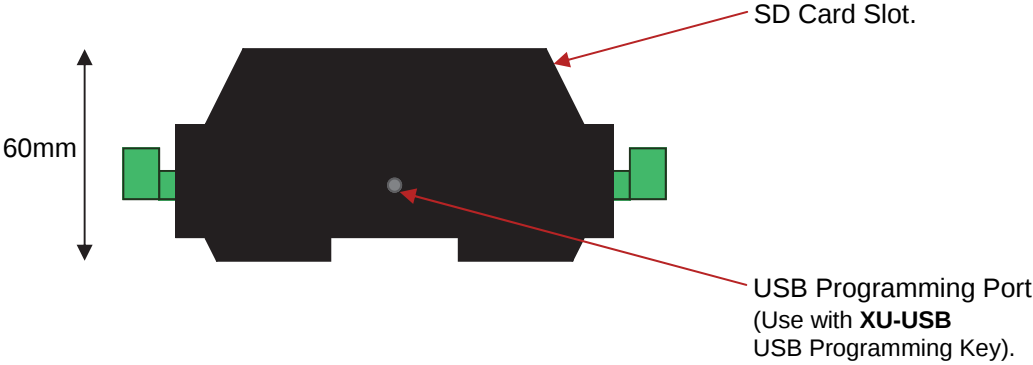
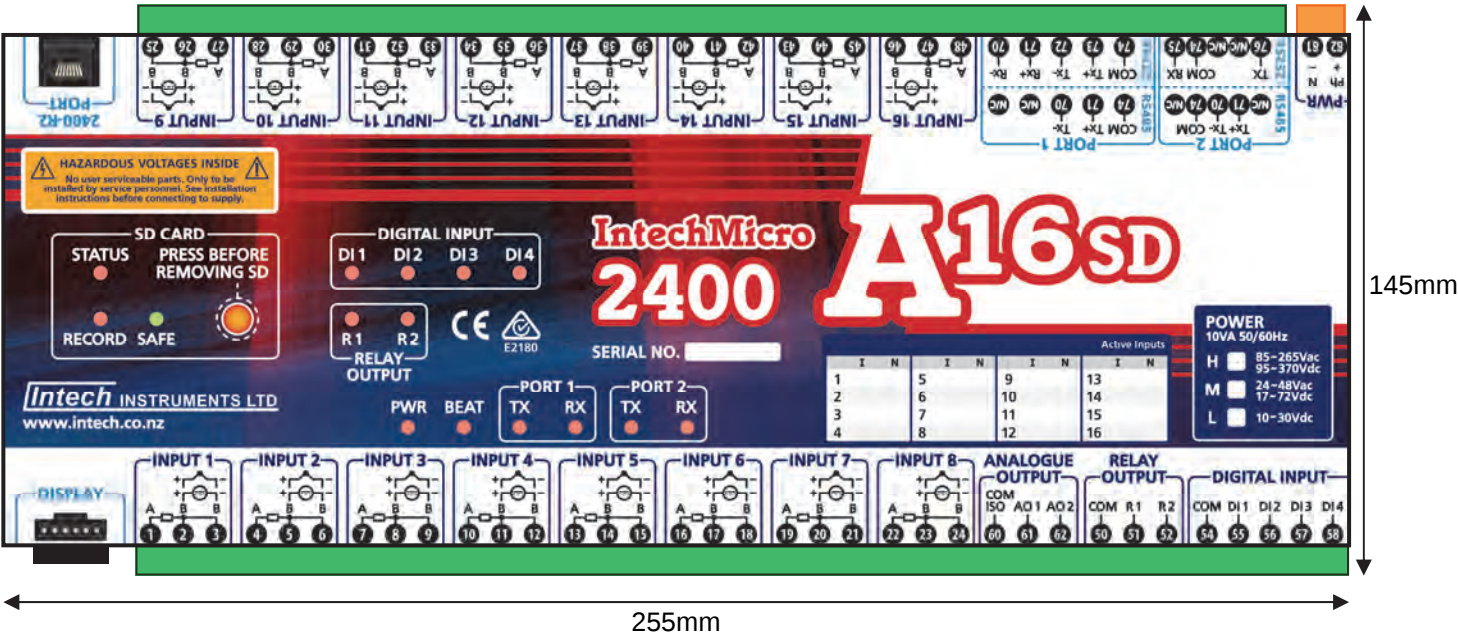
2400-R2: 16 Channel Relay Output Expander.

Z-2400-RB: Wireless Base/Remote for RS485/422/232 Comms.

Z-2400-TCP: Wireless Base only for Ethernet TCP/IP Comms.

Z-2400-Sleeper: Wireless Battery Option for 2 Universal Inputs.

2400-A16-SD Terminals and Layout & Dimensions.



Section 1 - 2400-A16-SD Station.

PLEASE READ THE FOLLOWING CAREFULLY.

Intech Micro Station Programmer Software.

This user friendly, free to download software supports the reading of SD cards on the 2400-A16-SD.

SAFE EJECT.

When the SD card is to be removed from the station, the 'PRESS BEFORE REMOVING SD' Safe Eject button must be pressed first. This allows the station software to close the logging file and write key information to the file.



Important: If you forget to press the Safe Eject button, **DO NOT** put the SD card back into the 2400-A16 station as the stored data will be overwritten. Take the SD card and insert into a computer with the Station Programmer software, as this should be able to repair the card's data.

SD Cards.

Please only use the supplied micro SD cards from Intech Instruments Ltd.

Always handle the SD cards carefully - avoid touching the gold contacts.

The SD software stores the 2400-A16-SD station's serial number in the SD card. When the same SD card is put back into the same station, the serial number will be recognised and data will be added to the end of the existing data series. When the SD card is full it will be rolled over (default). If the SD card is inserted into a different station, the software will start storing data at the start of the SD data file, overwriting any old data from the previous station.

When the SD card is out of the station, no data is stored in the station.

The SD card stores data records only, not any of the 2400-A16 station's configurations.

Memory Details & Store Rates.

1GB = 7858811 samples.

Store rates are selectable from:

1, 2, 5, 10, 15, 20 or 30 seconds,
1, 2, 5, 10, 15, 20 or 30 Minutes,
or 1 Hour max.

Data is stored on the minute for minute rates.

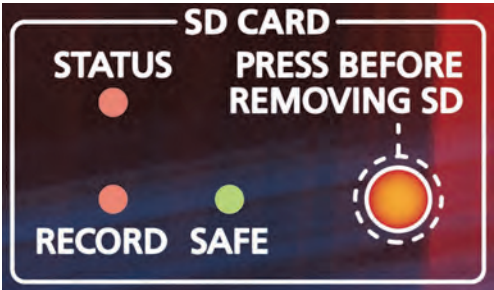
Second rates are stored on the second. (i.e. 5 sec will be 0, 5, 10, 15... seconds. 15 seconds will be 0, 15, 30... seconds.) Data is NOT averaged during the storage interval, so the stored reading is the value at the time that the sample is taken.

Station Real Time Clock.

The Station time is set by the station programming dialog box. It is set to UTC time and data records are stored using UTC time. This means that when the data is read out it is converted to the Local Time by the Windows time settings on the local computer and thus will be automatically converted according to daylight/standard time zones. Battery life for the real time clock is 5 years typical.

Station SD LEDs.

STATUS	Flashing	The SD logger is operating normally.
	ON	SD card error or flat battery fault. Use software to determine fault.
RECORD	ON	The SD card is recording data.
	OFF	The SD card is not recording.
	Flashing	The SD card is being formatted (creating SD logfile).
SAFE	ON	The SD card is safe to eject.
	OFF	The SD card is not safe to eject.



Normal 2400-A16 Station functions.

When the SD mode is being used all other 2400-A16 station functions will operate normally. For example: comms on PORT 1/2, PLC RTX modes, etc.

Reading SD data via Serial.

When using the Serial mode to read SD data, **ONLY ONE COMPUTER CAN READ DATA FROM THE SD CARD.** I.e. It is NOT possible to use the memory software on Port 1 and then connect another computer on Port 2 to read the same SD data from the same station.

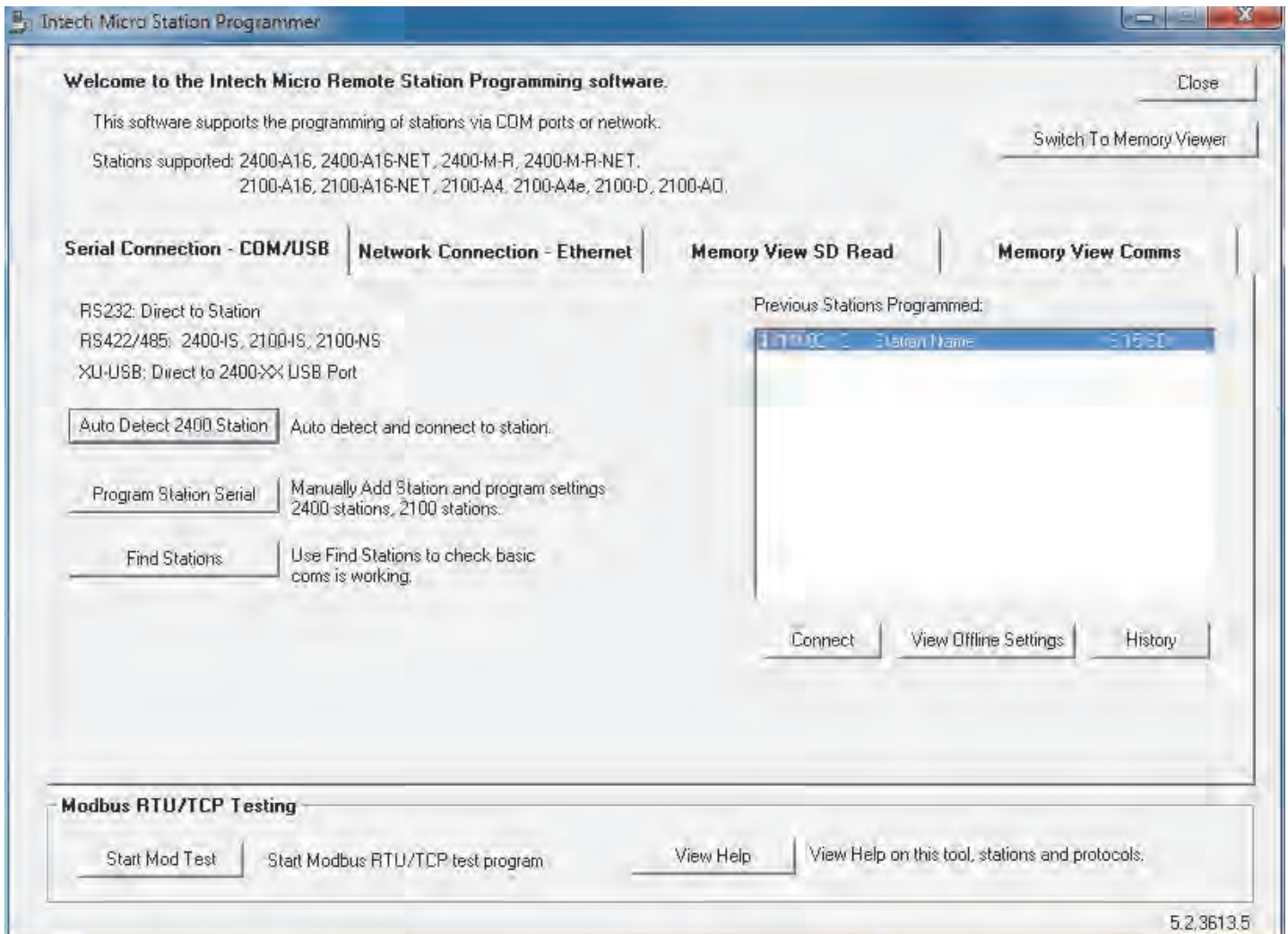
Section 2 - Intech Micro Station Programmer Software.

The user friendly Intech Micro Station Programmer Software is used for programming the Intech Micro 2400/2100 stations and the reading of SD cards on the 2400-A16-SD.

This software can be downloaded for free from www.intech.co.nz/downloads

- Install the software.
- Use the desktop icon 'Intech Micro Station Programmer' to start the software.

Software Overview:



Tab:	Description / Use:
Serial Connection - COM/USB	Adding Intech Micro stations via Serial connection.
Network Connection - Ethernet	Adding Intech Micro stations via Ethernet TCP/IP network - NET stations.
Memory View SD Read	Read SD cards via Computer SD port & View Graphs.
Memory View Comms	Read SD memory via comms/Ethernet. Manual and Automatic uploads.

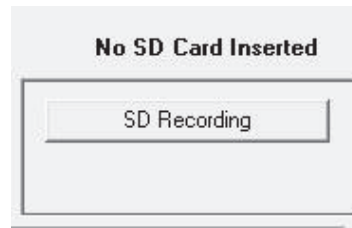
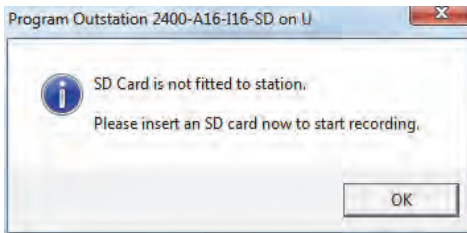
Note: Stations with SD software fitted will be shown with SD in the list of previous stations programmed.

Station Setup - Setting up the 2400-A16-SD for Logging.

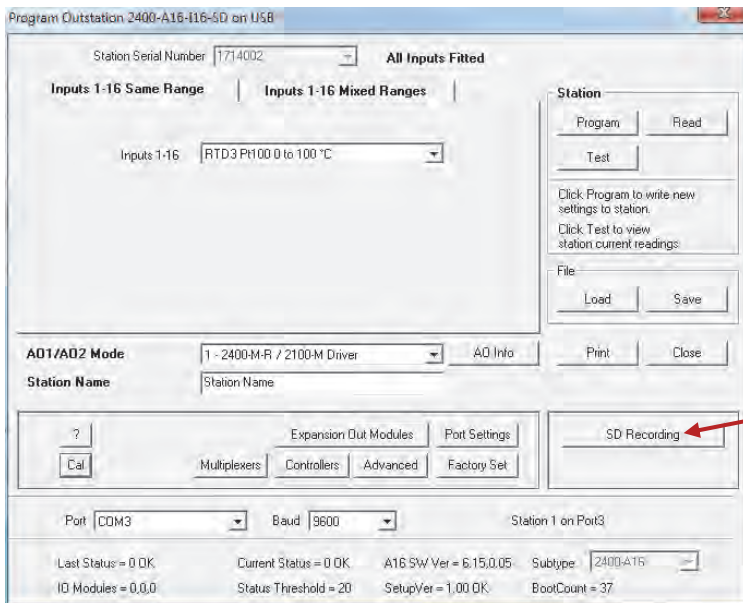
Add the station to the Station programmer: click Auto Detect 2400 Station

Note: You must add the station to the memory of the software so the station Input Ranges and Memory Pages & Lines setup can be completed.

If an SD card is not fitted to the station the following will be displayed (when the station programming info is read out):



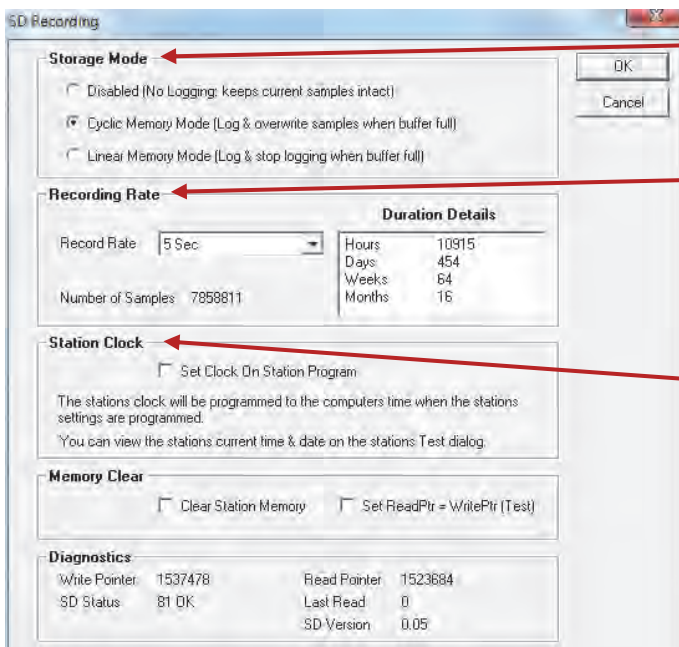
Station Programmer SD Recording Options.



In this area you can setup the station's input/output type and configurations. Further information can be found in the **2400-A16 Installation Guide**.

A 2400-A16 with SD software will be shown in the lower info panel: **A16 SW Ver = 6.15,0.05**. 0.05 = SD version.

The SD Recording button will also be shown. Click this to load the 'SD Recording' window.



Storage Mode.

Default setting is to 'Cyclic Memory', which is set to overwrite the oldest samples when the SD Card is full.

Recording Rate.

Select the Record Rate from the drop down menu. (e.g. Scan all channels every 5 seconds.)

Duration Details are calculated automatically based on the chosen Record Rate.

Station Clock.

To program current computer time to the station, tick the 'Set Clock On Station Program' box.

To finish click 'OK', then click 'Program' to save the settings to the 2400-A16-SD station.

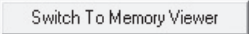
NOTES:

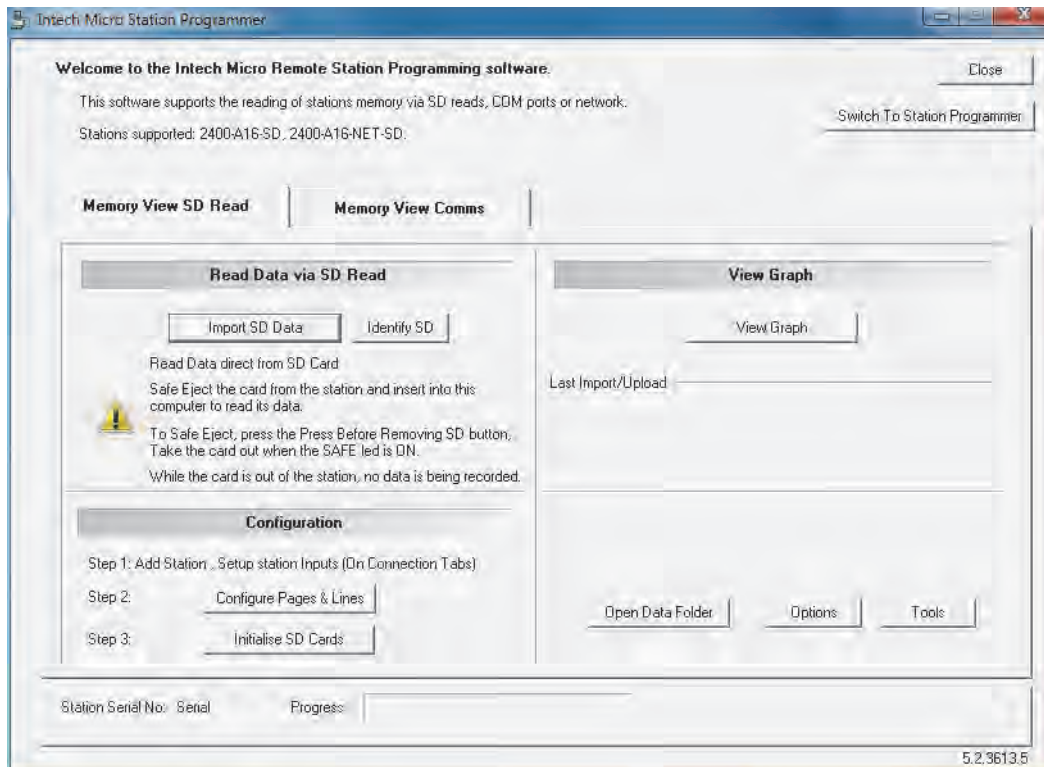
- The record rate should be chosen to suit the rate required. The rate selected also determines how existing store data is displayed in the same manner as store data is read from MicroScan data files in MicroScan. Changing the recording rate is not recommended, the pages and lines screen displays data at the current record rate. Therefore any data before the change will be displayed at incorrect frequencies.
- 'Clear Station Memory' and 'Set ReadPtr = WritePtr' are both engineering test settings.
- Diagnostics:** For normal operation, the 'Number of Samples' will be 7858811, 'Write Pointer' will be a non zero value and SD status = '81 OK'.

SD Card Configuration and Setup.

Memory Viewer Mode.

In the Memory Viewer mode, the Connection tabs are removed and the software can only be used for SD memory functions.

Click the  button.



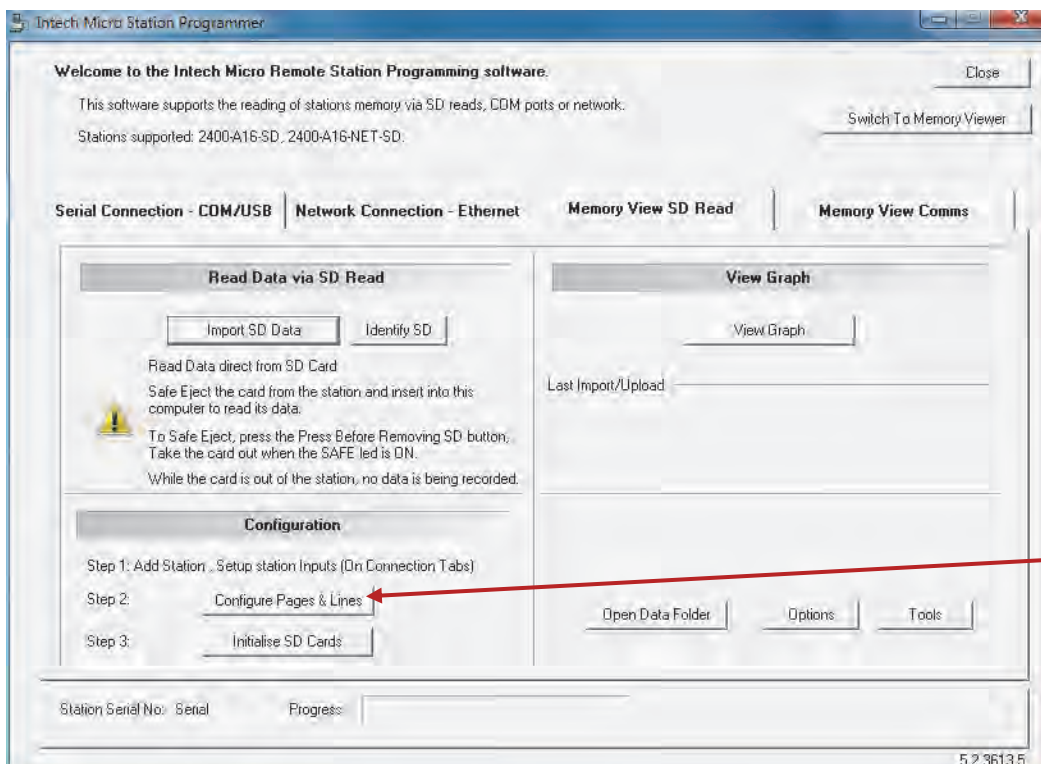
To return to Full mode, click the  button.

Configuring Page & Line Settings to Extract Data to.

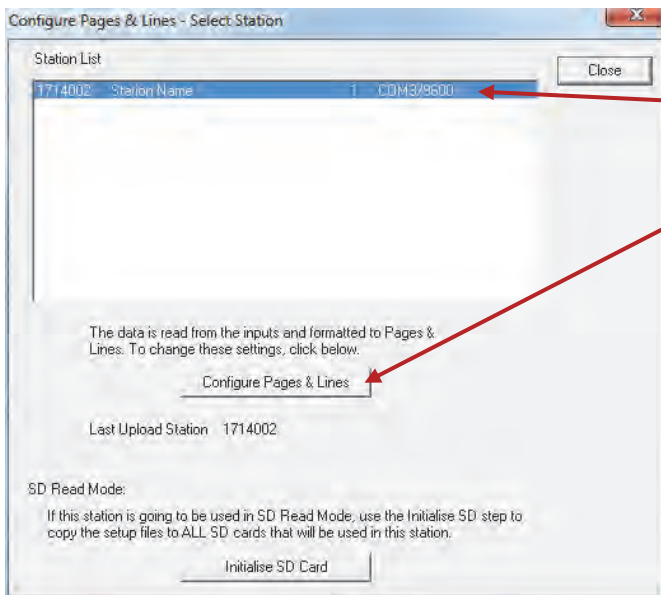
NOTE: These settings are stored on the LOCAL COMPUTER.

If the data is to be read out on another computer, you must use the 'Initialise SD Card' step (see page 10), to copy the settings to the SD card(s) used with this station.

Add the station to the Station Programmer as above.

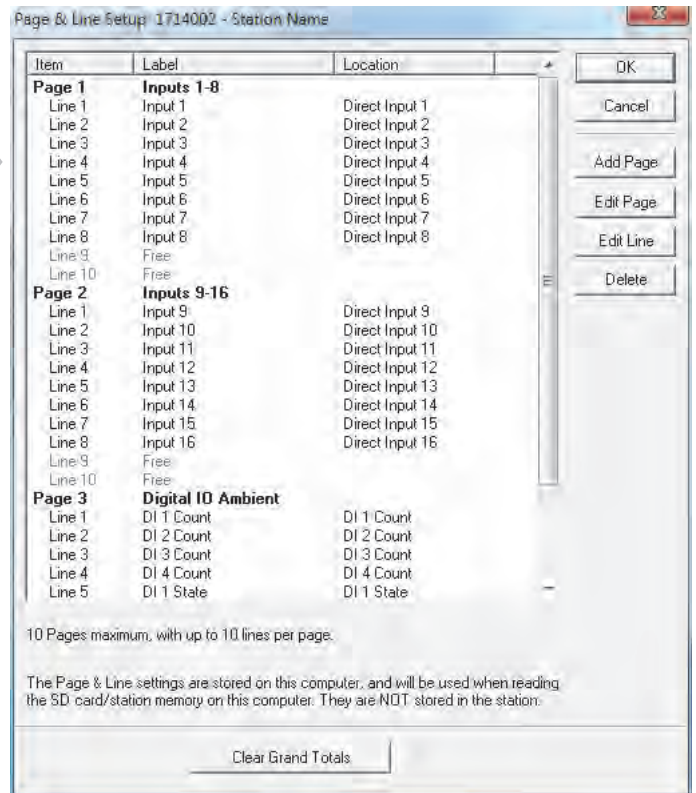


Click 'Configure Pages & Lines'.



Select the station,

then click the 'Configure Pages & Lines' button.



To edit a page, select the page and click 'Edit Page'.

To edit a line, select the line and click 'Edit Line'.

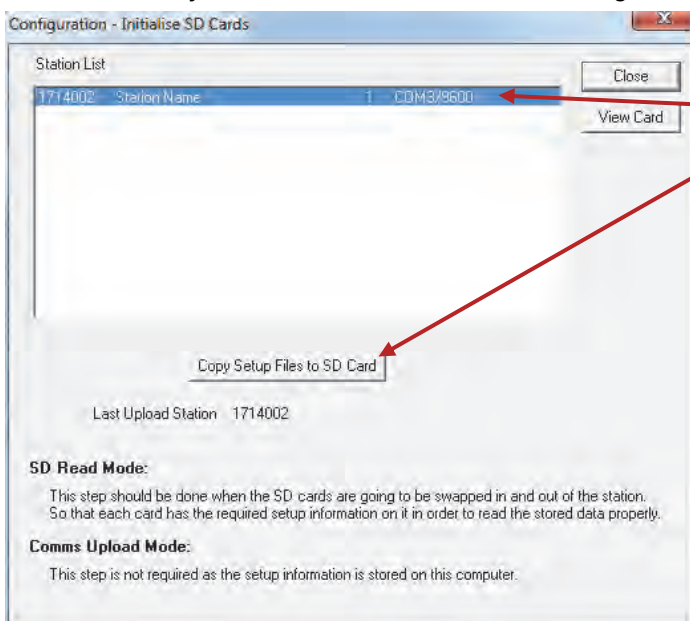
To create a new page, click 'Add Page'.

Up to 10 pages can be created, with up to 10 lines per page.

Initialise SD Card.

The Initialise SD Card step is used to copy station programming and setup info to the SD card. This means that the same card can be read using another computer. This step needs to be completed with the SD card in the computer's SD card slot.

On the 'Memory View SD Read' tab or in the 'Configure Pages & Lines' screen, click the 'Initialise SD Cards' button.



Insert the SD card that is to be used with this station into your computer's SD card slot.

Select the relevant station from the Station List.

Then click 'Copy Setup Files to SD Card'.

NOTE: The Initialise SD step copies setup data to the SD card in separate files from the main log file. It is not related in any way, apart from being a tool to extract data out from the log file.

In addition to copying the files, 'CARD_A', 'CARD_B' etc. will be written to the card's volume name in an aid to identify the card when viewed with Windows Explorer:



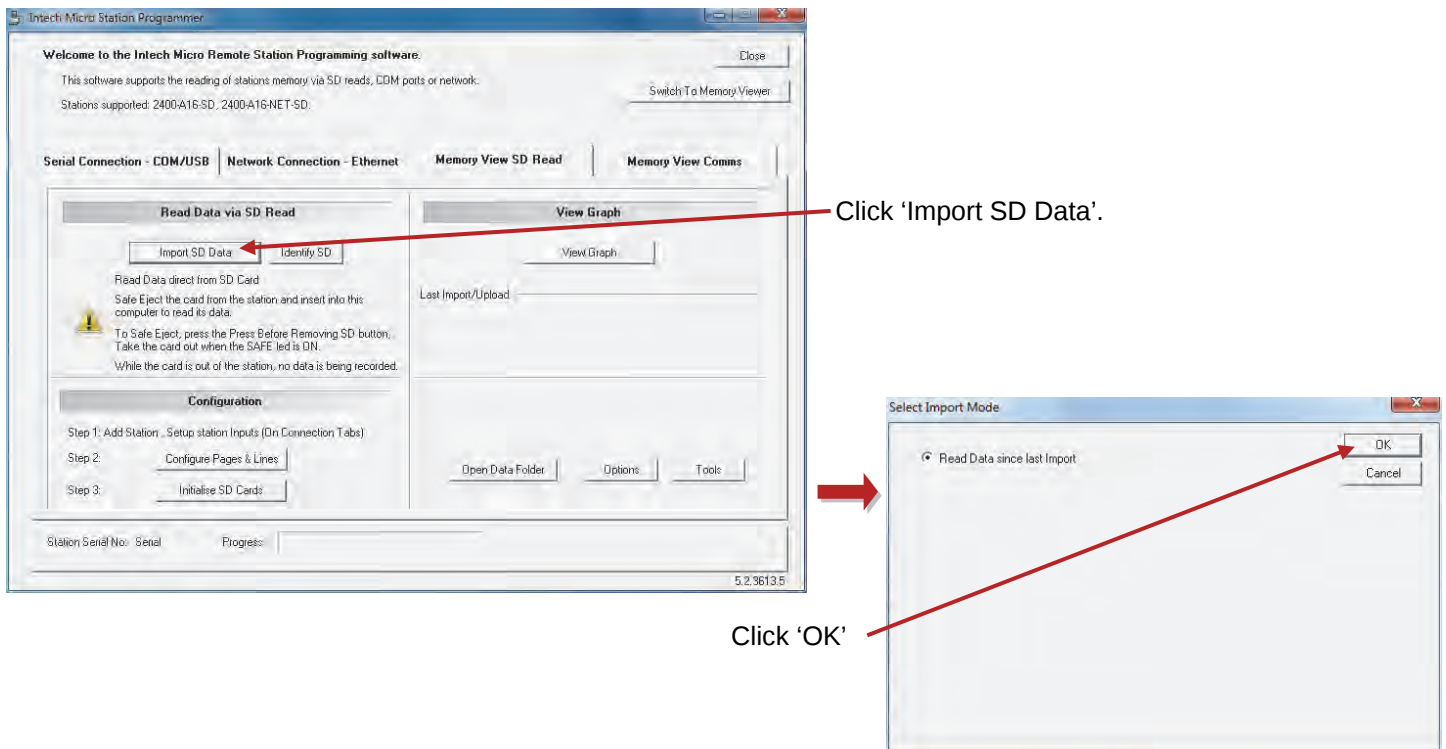
Importing SD Card Data into Station Programmer.

Press the Safe Eject button on the station ('PRESS BEFORE REMOVING SD' button ). The SAFE LED will come on. Press the SD card in, this will unlock the SD latch and the card will pop out slightly. The SAFE LED will go out. Remove the SD card and place into a SD reading tool (either SD adaptor or USB to SD adaptor), then plug into the computer. Windows should detect the SD card as a removable drive.

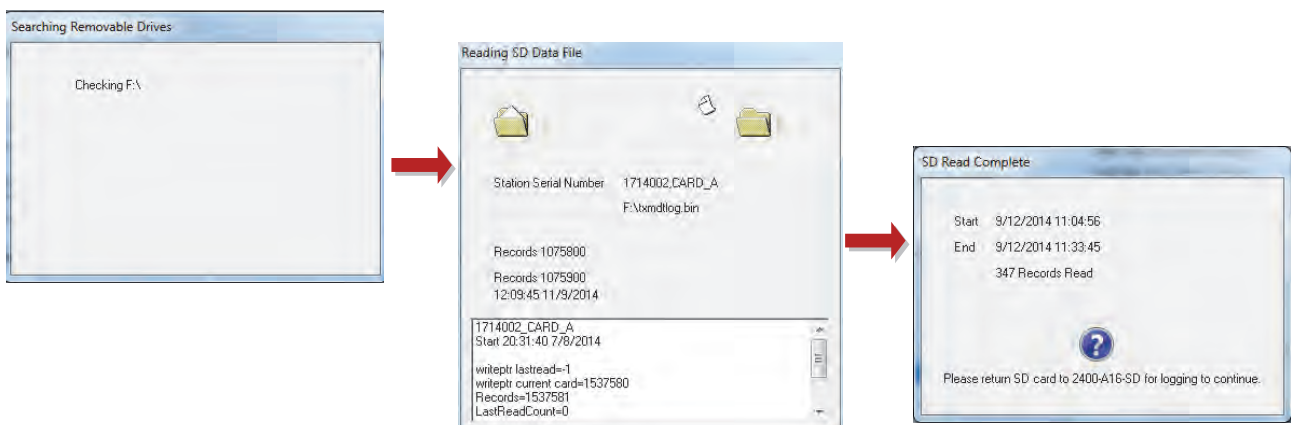
On the SD software, click the 'Memory View SD Read' tab. Click the 'Import SD Data' button. The SD software will search the computers removable drives for the SD log file and then read the data out. All new downloads are read to new files and then mapped together for graphing.

When the SD read is complete, the SD card needs to be returned to the station as soon as possible for logging to resume. Safely Eject (see below), the SD card from the computer and take it to the 2400-A16. Insert the SD card and you will hear a click, the RECORD LED should come back on.

After the Safe Eject button is pressed, you have 20 seconds to remove the SD card. After this time the Safe LED will go out and RECORD mode starts again.



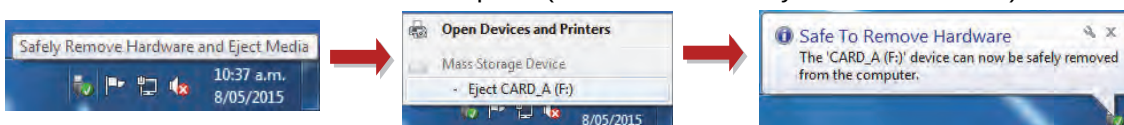
Progress windows as data is being read:



Completion information is shown.

The View Graph window will then be displayed.

Please take the SD card out of the computer (Use Windows safely remove hardware) and insert back into the 2400-A16.



Each SD upload is read into one set of files in the memory viewer program, and chained together using the MicroScan History page.map files.

Identify SD.

The Identify SD function will allow you to show what information is on the card without extracting it:

Insert the SD card into the computer and click the 'Identify SD' button.



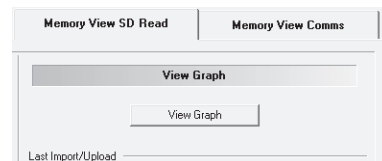
Click 'View Data' to view the time/date stamp of all data in the SD file as shown below.

Date	Time	Type
8/05/2015	10:25:00	Data
8/05/2015	10:25:05	Data
8/05/2015	10:25:10	Data
8/05/2015	10:25:15	Data
8/05/2015	10:25:20	Data
8/05/2015	10:25:25	Data
8/05/2015	10:25:30	Data
8/05/2015	10:25:35	Data
8/05/2015	10:25:40	Data
8/05/2015	10:25:45	Data
8/05/2015	10:25:50	Data
8/05/2015	10:25:55	Data
8/05/2015	10:26:00	Data
8/05/2015	10:26:05	Data
8/05/2015	10:26:10	Data
8/05/2015	10:26:15	Data
8/05/2015	10:26:20	Data
8/05/2015	10:26:25	Data
8/05/2015	10:26:30	Data
8/05/2015	10:26:35	Data
8/05/2015	10:26:40	Data
8/05/2015	10:26:45	Data
8/05/2015	10:26:50	Data
8/05/2015	10:26:55	Data
8/05/2015	10:27:00	Data
8/05/2015	10:27:05	Data
8/05/2015	10:27:10	Data
8/05/2015	10:27:15	Data
8/05/2015	10:27:20	Data
8/05/2015	10:27:25	Found SD
8/05/2015	10:27:30	Found SD

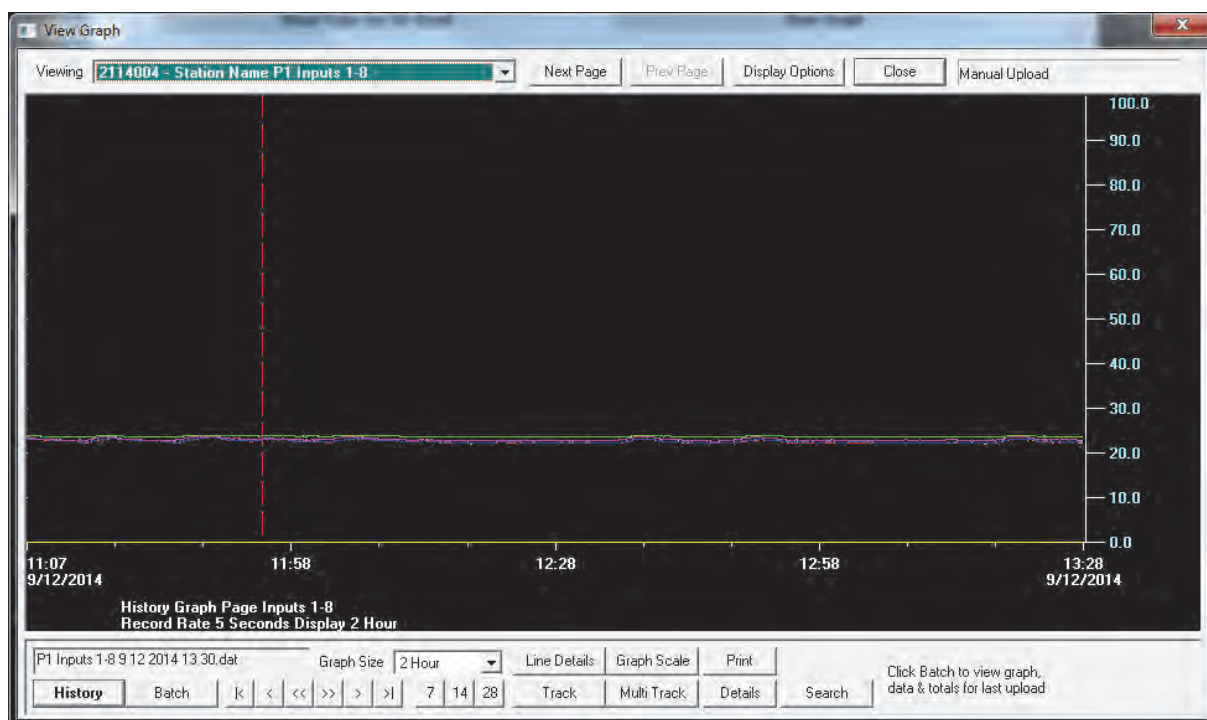
Viewing the SD Graph.

Use the 'View Graph' button from the 'Memory View SD Read' tab to view the history data. This opens a MicroScan history viewing window that allows display of the history data in history mode and batch mode.

To select the station/page to be viewed, choose from 'Viewing'. The most recent station that has been read will be highlighted in grey.



History View of data.



Batch View of Data.



The Batch view shows each download as one screen of data.

Display Options can be used to change background colour and fonts.

The 'Display Options' dialog box has two main sections: 'Line Graph' and 'Font'. In the 'Line Graph' section, the 'Line' is set to 'Red' and 'File Markers' are checked. In the 'Font' section, the 'Line Graph' font is selected. There are 'OK' and 'Cancel' buttons. Below these sections, there are options for 'Background Colour' (set to 'Black') and 'Batch File Display' (with radio buttons for 'Average', 'Minimum', and 'Maximum').

Line Details

Show Line	Location
☒	1 - Input 1
☒	2 - Input 2
☒	3 - Input 3
☒	4 - Input 4
☒	5 - Input 5
☒	6 - Input 6
☒	7 - Input 7
☒	8 - Input 8

Buttons: Redraw, Exit

Graph Scale

The 'Graph Scale' dialog box has sections for 'Y Axis' and 'Time Scale'. In the 'Y Axis' section, the 'Top of Graph' is set to 100.0 and the 'Bottom of Graph' is set to 0.0. The 'Select Range' is set to '-50 to +50'. In the 'Time Scale' section, the 'Time Scale' is set to '2 Hour'. There are 'Redraw' and 'Exit' buttons.

Mouse Track

The 'Mouse Track' dialog box displays the following information:

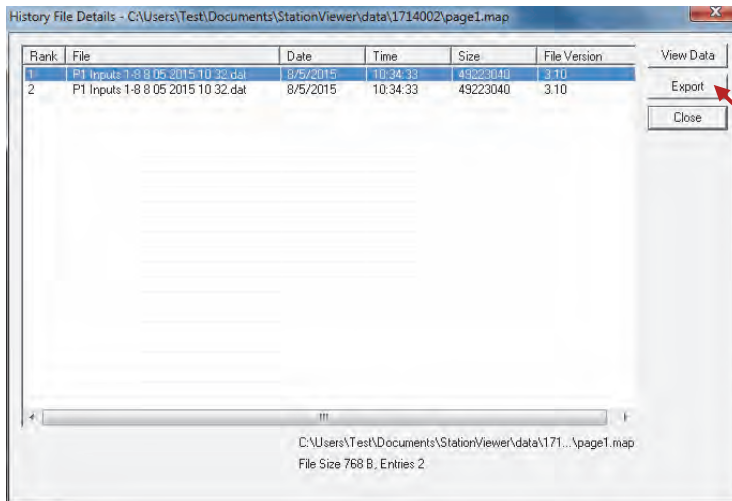
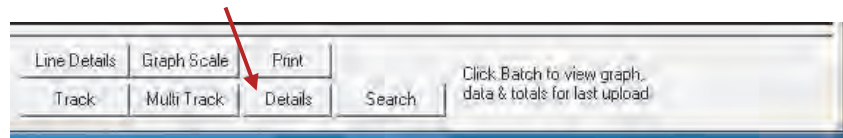
- Value = 38.1
- Time 12:22:05 (318)
- Date 09/12/2014

Multi Track

Time 12:29:30 09/12/2014 (407)	
1 - Input 1	22.3
2 - Input 2	23.6
3 - Input 3	22.4
4 - Input 4	0.0
5 - Input 5	22.9
6 - Input 6	105.0
7 - Input 7	105.0
8 - Input 8	105.0

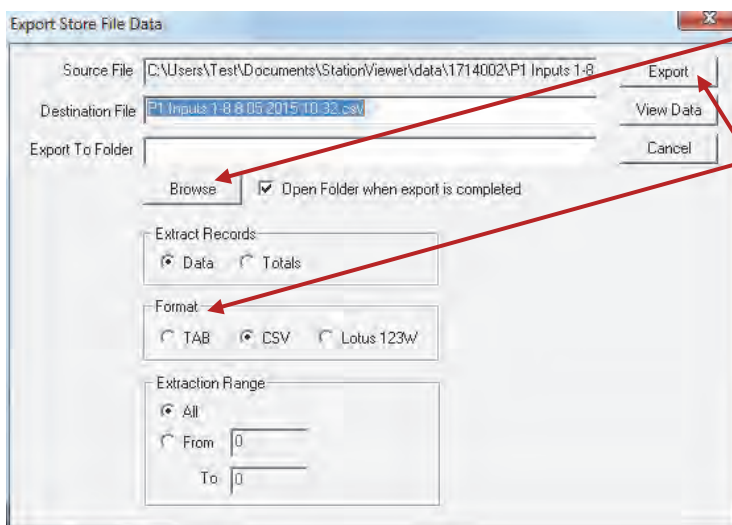
Exporting Data From Station Programmer.

To export data from Station Programmer to another format (e.g. CSV), start by opening the data you want in the 'View Graph' screen. Then near the bottom right, click on 'Details'.



The 'History File Detail' screen shows a list of batch downloads starting from the latest.

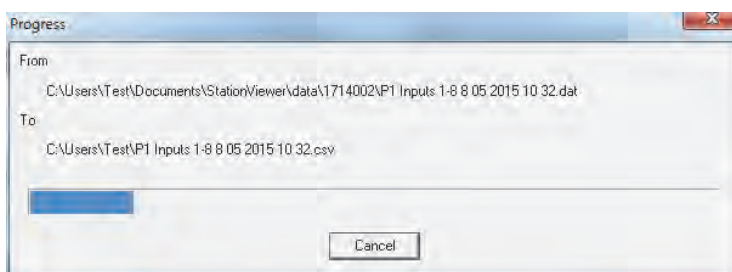
Select the batch file you would like to export. Then click on 'Export'.



Click 'Browse' to select a folder location where you would like to store the exported file.

Select the export format you require (CSV default).

Then click on 'Export'.

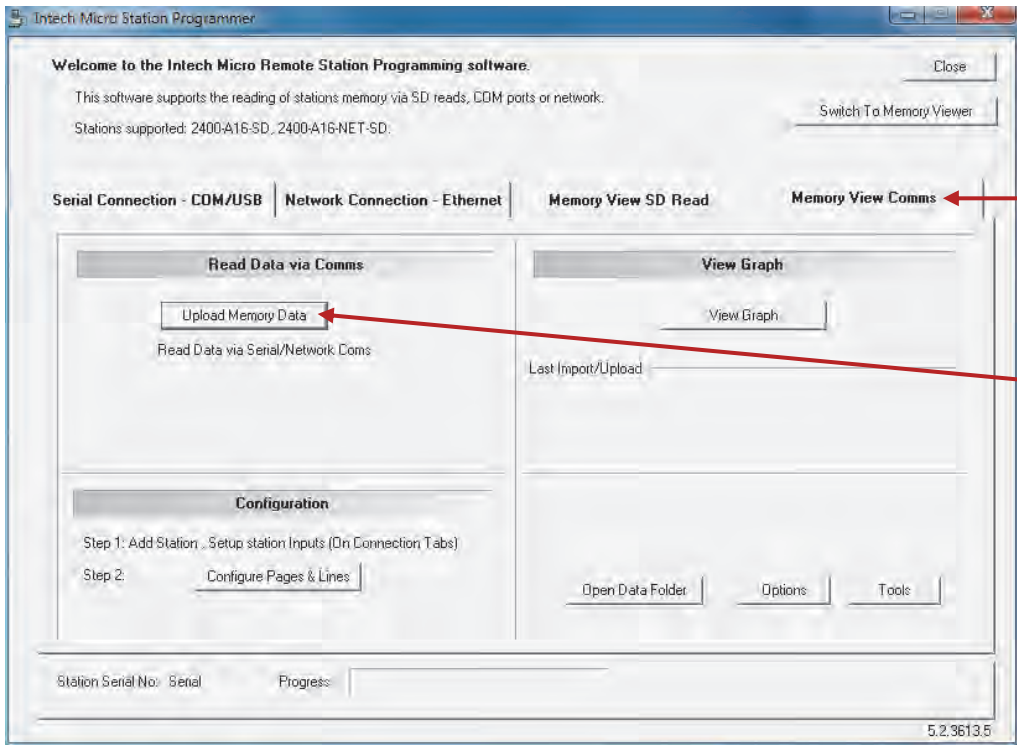


Once finished, a Windows Explorer Folder with the exported file will open (default).

Importing SD Card Data into Station Programmer via Comms.

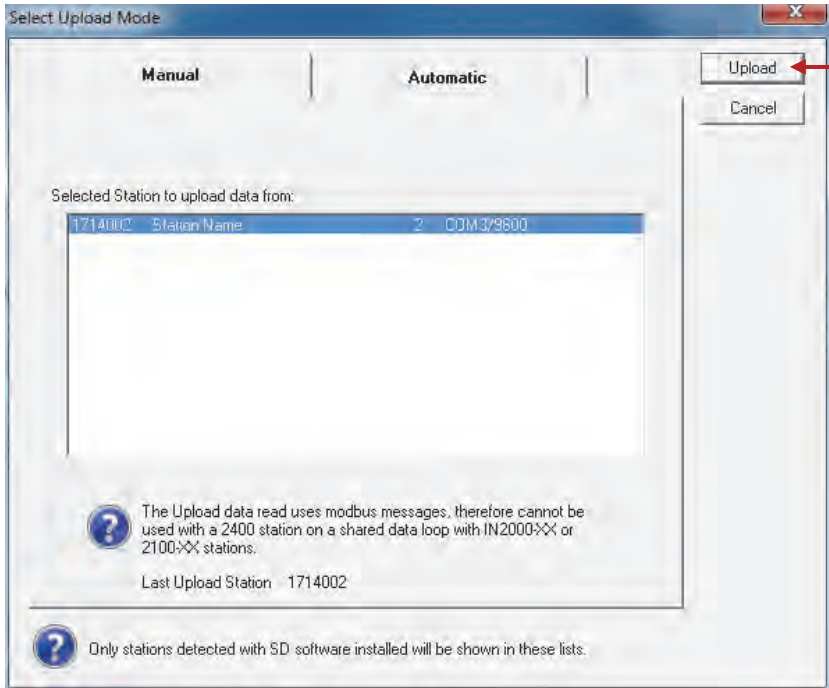
Manual Comms Download.

It is also possible to download data from the stations SD card without having to remove it by using the on board comms ports.



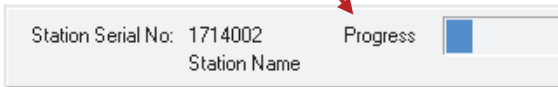
In the main window of the station programmer software click on the 'Memory View Comms' tab.

Then click 'Upload Memory Data'.



Click 'Upload'.

The program returns to the main window and the progress is shown near the bottom.



IMPORTANT:

Using serial comms to manually download data is **very slow**, and is not recommended. If the 2400-A16-SD station has an Ethernet comms port fitted, then this can be used to download the data from the SD card at a much faster rate (though still not as fast as direct read from the SD card on your computer).

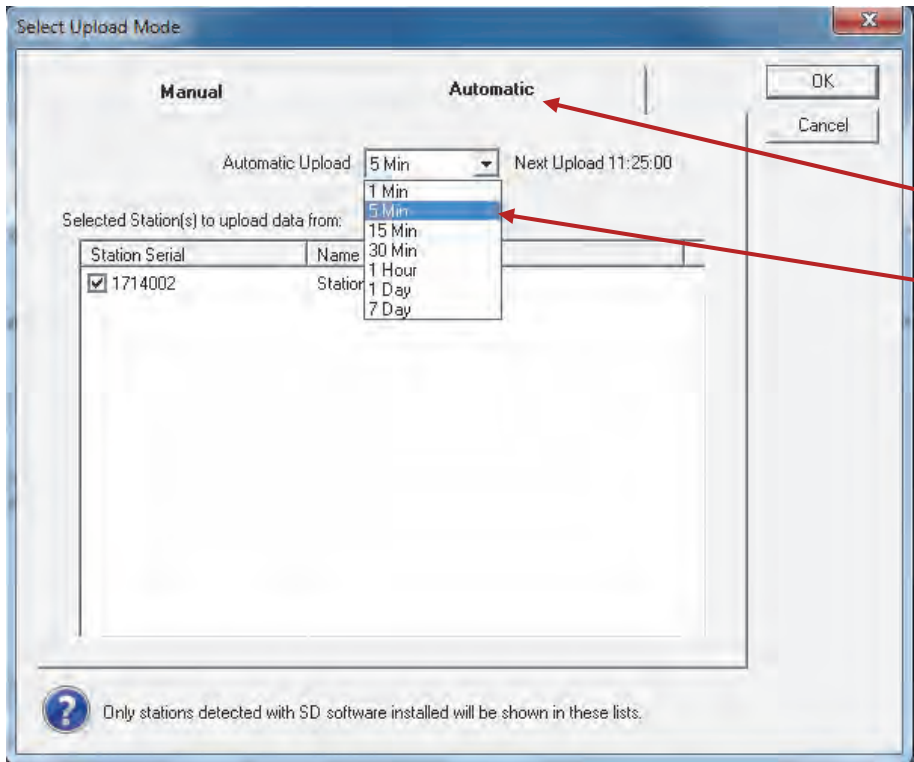
SD Download is NOT possible over Z-2400 Wireless link.

When using the serial comms to read SD data, **ONLY ONE COMPUTER CAN READ DATA FROM THE SD CARD.**

i.e. It is NOT possible to use the memory software on Port 1 and then connect another computer on Port 2 to read the same SD data from the same station.

Automatic Comms Download.

If you have a permanent comms connection with the 2400-A16-SD, it is possible to set the station programmer software to automatically download new data from the SD card at selectable time intervals. This method is safe to use on the stations serial comms ports, as the automatic upload sizes will be small.



Same as before:
Click on 'Upload Memory Data' in the
Memory View Comms tab.

Then click on the 'Automatic' tab.

Select an automatic upload time interval
from the drop down menu.
Click 'OK'.

Note: If the 2400-A16-SD station is also being used with a MicroScan SCADA system, then make sure to connect to the station on one of the separate comms ports.

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